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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/774,819	02/09/2004	Ronald Neil Drake	DRAK-001/00US	9231

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EXAMINER	
SAVAGE, MATTHEW O	
ART UNIT	**PAPER NUMBER**
1724	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/11/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/774,819	DRAKE, RONALD NEIL	
	Examiner	Art Unit	
	Matthew O. Savage	1724	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 February 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *21-103* is/are pending in the application.

4a) Of the above claim(s) *21-36,47,49-77,88 and 90-103* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *37-46,48,78-87 and 89* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *2-9-04, 12-27-04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Applicant's election without traverse of group II and the gravity settler species in the reply filed on 2-21-07 is acknowledged.

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the gravity settler recited in claims 48 and 89 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 37-46, 48, 78-87, and 89 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The concept of the contaminated water including desirable components and separating the purifying material from the treated water before substantial amounts of the desirable components are removed from the treated water as recited in claim 37 is considered new matter.

The concept of leaving some of the undesirable components in the treated water as recited in claim 41 is considered new matter.

The concept of the monovalent cations being undesirable components and the multivalent cations as being desirable components as recited in claim 46 is considered new matter.

The concept of continuously varying an amount of purifying material mixed with the contaminated water so as to continuously vary the amount of undesirable components removed from the contaminated water as recited in claim 78 is considered new matter.

The concept of the separating occurring before a substantial amount of desirable components are removed from the treated water as recited in claim 82 is considered new matter.

The concept of varying the amount of purifying material so as to remove substantially all of the undesirable components from the contaminated water as recited in claim 83 is considered new matter.

Claims 37-46, 48, 78-87, and 89 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a process for removing sodium and calcium ions from sodic water with a cationic exchange resin that adsorbs calcium ions more strongly that sodium ions, does not reasonably provide enablement for removing any type of contaminant from water with any type of purifying material as recited in the instant claims. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to practice the invention commensurate in scope with these claims.

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: the language of claims 37-46, 48, 78-87, and 89 lacks basis in the instant specification.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 78-81, 84-87, and 89 are rejected under 35 U.S.C. 102(b) as being anticipated by Kunz.

With respect to claim 78, Kunz discloses a method for purifying contaminated water including receiving the contaminated water (e.g., via inlet line 6), mixing the contaminated water with a purifying material (e.g., with a cation exchange resin in chamber 10), the purifying material being adapted to combine with undesirable components (e.g., sodium ions) from the contaminated water so as to generate treated water, continuously varying an amount of purifying material mixed with the contaminated water so as to continuously vary the amount of undesirable components removed from the contaminated water (e.g., with regenerating system 2), and separating the purifying material from the treated water (e.g., via gravity at a top of chambers 10 and 12).

Concerning claim 79, Kunz discloses removing additional undesirable components before removing the undesirable components from the contaminated water (e.g., via regenerating column 2).

Concerning claim 80, Kunz discloses transporting both the purifying material and the contaminated water to a separator while the purifying material combines with the undesirable components (e.g., formed by top of chambers 10 and 12).

With respect to claim 81, Kunz discloses continuous movement of the purifying material and the contaminated water to the separator (see the drawing).

As to claim 84, Kunz discloses mixing the contaminated water with the purifying material in a reaction volume 10, 12 of a fluidized bed reactor.

Regarding claim 85, Kunz discloses reducing a contact time between the purifying material and the desirable components by adjusting the reaction volume (e.g., when initially building the exchange column 1).

Concerning claim 86, Kunz discloses the purifying material as including an ion exchange media (see the abstact).

As to claim 87, Kunz discloses the undesirable components include monovalent cations (e.g., sodium ions) and the desirable components include multivalent cations (e.g., calcium and magnesium ions).

Regarding claim 89, Kunz discloses the separating is carried out by a gravity settler (e.g., formed by an upper portion of chamber 10).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 37-46, 48, 82, and 83 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kunz in view of the "Encyclopedia of Separation Technology", volume 2, pages 1074-1077.

With respect to claim 37, Kunz discloses receiving contaminated water (e.g., via pipe 6), removing undesirable components (e.g., sodium) from the contaminated water with a purifying material to generate treated water (e.g., the cation exchange material contained in chambers 10 and 12), the treated water containing desirable components (e.g., calcium and magnesium), the purifying material attracting both undesirable and desirable components (see lines 48-51 of col. 3), and separating the purifying material from the treated water (e.g., via gravity at a top of chambers 10 and 12). Kunz fails to specify separating the purifying material from the treated water before substantial amounts of the desirable components are removed from the water. The Encyclopedia of Separation Technology teaches that the rate of removal of ions is proportional to the concentration of the ionic species and the contact time. It would have been obvious to have modified the process of Kunz so as to have included the step of separating the purifying material from the treated water before substantial amounts of the desirable components are removed from the water in order to maximize sodium ion removal and minimize calcium ion removal since the Encyclopedia of Separation Technology teaches that the rate of removal of ions is proportional to the concentration of the ionic species and the contact time.

Concerning claim 38, Kunz discloses removing additional undesirable components before removing the undesirable components from the contaminated water (e.g., via regenerating column 2).

Regarding claim 39, Kunz discloses removing undesirable components from the contaminated water while transporting the contaminated water and the purifying material to a separator (e.g., formed by a top of chambers 10 and 12).

As to claim 40, Kunz discloses transporting the contaminated water including substantially continuous movement of the contaminated water and the purifying material to the separator (see the drawing).

Concerning claim 41, Kunz fails to specify leaving some undesirable components in the treated water, however, such a modification would have been obvious in order to optimize the process for a particular application.

Regarding claim 42, Kunz discloses the rate of the transporting the contaminated water as being controlled by a continuously moving rotary valve in the form of a pump 7.

As to claim 43, Kunz discloses removing undesirable components from the contaminated water is carried out in a reaction volume 10, the reaction volume including a volume of a fluidized bed reactor.

Regarding claim 44, Kunz discloses reducing a contact time between the purifying material and the desirable components by adjusting the reaction volume (e.g., when initially building the contact chamber).

Concerning claim 45, Kunz discloses the purifying material as including an ion exchange media (see the abstact).

As to claim 46, Kunz discloses the undesirable components include monovalent cations (e.g., sodium ions) and the desirable components include multivalent cations (e.g., calcium and magnesium ions).

Regarding claim 48, Kunz discloses the separating is carried out by a gravity settler (e.g., formed by an upper portion of chamber 10).

As to claim 82, Kunz fails to specify separating occurs before a substantial amount of desirable components are removed from the treated water. The Encyclopedia of Separation Technology teaches that the rate of removal of ions is proportional to the concentration of the ionic species and the contact time. It would have been obvious to have modified the process of Kunz so as to have included the step of separating the purifying material from the treated water before substantial amounts of the desirable components are removed from the water in order to maximize sodium removal and minimize calcium since the Encyclopedia of Separation Technology teaches that the rate of removal of ions is proportional to the concentration of the ionic species and the contact time.

Regarding claim 83, Kunz fails to specify varying the amount of purifying material so as to remove substantially all the undesirable components from the contaminated water, however, such a modification would have been in order to optimize the process for a particular application since "The Encyclopedia of Separation Technology" teaches that the ion removal rate is dependent upon the contact time between the fluid and ion exchange material.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew O. Savage whose telephone number is (571) 272-1146. The examiner can normally be reached on Monday-Friday, 7:00am-3:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on (571) 272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Matthew O. Savage
Matthew O Savage
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